



PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 2003M091	FOR FURTHER ACTION		See Form PCT/PEA416
International application No. PCT/EP2004/009357	International filing date (day/month/year) 20.08.2004	Priority date (day/month/year) 29.08.2003	
International Patent Classification (IPC) or national classification and IPC C07C69/80, C07C67/08, C07C67/48, H01B3/44			
Applicant EXXONMOBIL CHEMICAL PATENTS INC. et al.			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> sent to the applicant and to the International Bureau a total of sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>			
Date of submission of the demand 29.06.2005		Date of completion of this report 29.11.2005	
Name and mailing address of the International preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer Sen, A Telephone No. +49 89 2399-8328 	

10/568699**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**International application No.
PCT/EP2004/009357**IAP20 RESC. 17 FEB 2006****Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

1-30 as originally filed

Claims, Numbers

1-35 as originally filed

Drawings, Sheets

1/2-2/2 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	7-28
	No: Claims	1-6,29-35
Inventive step (IS)	Yes: Claims	
	No: Claims	1-35
Industrial applicability (IA)	Yes: Claims	1-35
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

10/200699
IAP20 Received 17 FEB 2006

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- D1: US-A-5 880 310
D2: GB-A-1 096 917
D3: US-A-5 798 319
D4: US-A-4 284 793
D5: US-B1-6 437 170
D6: PATENT ABSTRACTS OF JAPAN vol. 2000, no. 24, 11 May 2001 (2001-05-11)
& JP 2001 206866 A

SECTION V:

1. **Claims 1-6** directed to a di-alkyl phthalate compound characterised by a degree of specified features meet an objection under Article 33(2) PCT in view of the prior art documents D1-D6 which all describe this class of compounds in connection also with the indicated degree of chemical purity (see D1: column 3, lines 29-30 and 41-43; Examples, Tables 1, 2 and 3; see D2: Examples I to IV; see D3: column 5, line 24; column 15, Table 1, lines 36-39; claims, in particular claims 1-9; see D4: Examples; Table 1, 2 and 3; see D5: column 2, lines 25-31; column 12, Example 2; claims; see D6: "abstract" and Figure 1, Table). Accordingly, the documents cited describe pure compounds which are not contaminated by a light ends content and which have been measured with regard to the acid value and the volume resistivity.

2. **Claims 7-28** directed to a process for the production of a plasticiser ester are considered not to meet an objection under Article 33(3) PCT in view of the combined teachings of D5 and D3 / D4 (see D3: column 6, lines 1-3; see D4: column 2, lines 23-48). D5 describes the step of neutralizing the crude diester compound with an aqueous alkali, such as aqueous sodium hydroxide, forming a two-phase mixture, separating off the aqueous phase and washing the organic phase. For further purification, the neutralized and washed diester is stripped to form a stripped material, and this material is further treated with an adsorbent, such as activated carbon, followed by filtration via a filter aid (see D5: column 12, lines 3-32, in particular 29-32 for indications regarding the quality of the final compound). As noted by the Applicant the document D5 does not indicate a filter step between the steps of treating with a base and stripping (see step (iii) in claim 7). This step is however indicated in D3 and/or D4 in the context of the "filtration of solids from the ester mixture containing the bulk of the excess alcohol used in the esterification" (see D3)

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and in the context of a general method in which "an ester is contacted with a large excess of a solid alkali in a treating vessel and the excessive alkali is recovered by providing a solid-liquid separator" (see D4).

The inventive step objection for the above-mentioned set of claims is also raised in view of the teachings from the documents D1-D4 and D6:

D1 describes the process for the production of a plasticiser ester comprising esterifying an acid or an anhydride with an alcohol to form an ester compound, treating the crude ester with a base to form a treated ester, recovering the excess alcohol. The resulting product is then purified through a combination of finefiltration using a filter aid and adsorption treatment, so that a plasticizer ester having an excellent volume resistivity values and an acid value well below 0.2 mg KOH/g is obtained (see D1: Tables 1, 2, 3). D2 describes treating the crude ester product with an adsorbent, and filtering the product "through a bed of kieselguhr supported on sintered glass".

D3 describes the addition of an adsorbent to the reaction mixture following esterification. Addition of water and base, removal of the water, filtration of solids from the ester mixture, removal of excess alcohol and removal of any residual solid from the stripped ester provides an ester product with a lower total acid number and a higher volume resistivity. D4 has a feature in the treatment of the ester with a solid alkali, followed by treatment with an adsorbing agent and then filtration. The results provided in D4 show a lower acid value of 0.002 mg KOH/g and a high volume resistivity.

D6 also describes the steps comprising the removal of the monohydric alcohol compound and the use of an adsorbent followed by filtration. The acid number and the volume resistivity are shown in the Table provided along with the abstract.

The difference between the process described in the application and the processes described in the prior art documents D1-D4 and D6 is based only on a different sequence of the purification steps. For example the difference with respect to D1 is that in D1 the filtration is carried out only at a latter moment, and thus that undesired "solids could be present in the reaction mixture during the stripping procedure" (see the application on page 5, lines 3-8). On the other hand, in view of the fact that a filtration step before or after treatment with an adsorbent does not seem connected with an unexpected and surprising effect and, in this context, in view of the fact that modifications in purification up procedures, as described in the art, provide final ester compounds of similar high quality, an inventive step cannot be recognized.

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3. **Claims 29 - 33** directed to a method for purifying a plasticiser ester "which comprises forming a mixture of the ester and an adsorbent and subsequently filtering the mixture" as well as to the use of a mixture of activated carbon and filter aid in the purification by filtration of a plasticiser ester" meet an objection under Article 33(2) PCT in view of the prior art documents D1-D6 (see D1: column 5, lines 7-15; see D2: page 1, lines 57-63; see D3: claims, e.g. claim 3; see D4: claim 1; see D5: column 12, lines 23-28; see D6: "abstract"/ compare the application on page 14, lines 13-16 and page 16, line 30, "the adsorbent, e.g. active carbon").

4. **Claims 34 and 35** directed to a polyvinyl chloride composition and its use meet also an objection under Article 33(2) PCT in view of the prior art documents D1-D6 (see for example D1: column 1, lines 14-21; see D5: column 2, lines 25-31; column 12 to column 13, line 3).